

We claim:

1. A process for preparing at least one partial oxidation and/or ammoxidation product of a hydrocarbon by subjecting at least one saturated hydrocarbon H to a heterogeneous catalyzed dehydrogenation in the gas phase to form a product gas mixture A which comprises at least one partially dehydrogenated hydrocarbon H, leaving constituents present in the product gas mixture A, other than the saturated hydrocarbon H and other than the partially dehydrogenated hydrocarbon H therein, or partly or fully removing them to obtain a product gas mixture A', and subjecting product gas mixture A and/or product gas mixture A', as a constituent of a gas mixture B, to at least one heterogeneous catalyzed partial oxidation and/or ammoxidation of the at least one partially dehydrogenated hydrocarbon H present in the product gas mixture A and/or product gas mixture A', which comprises subjecting the product gas mixture A, the product gas mixture A' and/or the gas mixture B, before the at least one heterogeneous catalyzed partial oxidation and/or ammoxidation, to at least one mechanical separating operation by which solid particles present in these gas mixtures can be removed.
2. A process as claimed in claim 1, wherein the saturated hydrocarbon H is propane, and the heterogeneous catalyzed partial oxidation of the partially dehydrogenated hydrocarbon H is the partial oxidation of propene to acrolein and/or acrylic acid.
3. A process as claimed in claim 1, wherein the saturated hydrocarbon H is isobutane, and the heterogeneous catalyzed partial oxidation of the partially dehydrogenated hydrocarbon H is the partial oxidation of isobutene to methacrolein and/or methacrylic acid.
4. A process as claimed in claim 1, wherein the saturated hydrocarbon H is propane, and the heterogeneous catalyzed partial ammoxidation of the partially dehydrogenated hydrocarbon H is the partial ammoxidation of propene to acrylonitrile.
5. A process as claimed in claim 1, wherein the saturated hydrocarbon H is isobutane, and the heterogeneous catalyzed partial ammoxidation of the partially dehydrogenated hydrocarbon H is the partial ammoxidation of isobutene to methacrylonitrile.